

Original Research Article

Analysis of the impact of ESG investment on stock returns of listed companies

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Abstract: As social and environmental problems such as ageing populations, extreme weather and wars have become more prominent, the previous development pattern has been considered wrong and sustainable development is recognized globally. As an extension of the concept of sustainable development, ESG investment has been paid more and more attention. The thesis selects Bloomberg ESG, stock returns and financial data of Chinese listed companies from 2015 to 2021 as research samples, combines Fama-French five-factor model and fixed effects model and then introduces ESG rating factors to analyze the impact of ESG investment on stock returns of Chinese listed companies. The empirical results show that the ESG investment concept has begun to be accepted by China's stock market, and companies with different ESG performance can be distinguished by the market. Finally, this paper puts forward suggestions to the relevant subjects from the aspects of investment decision, information disclosure and evaluation system, hoping to further promote the development of ESG investment in China.

Keywords: ESG investment; stock returns; factor model; fixed effects model

1. Introduction

Amid global economic growth, environmental and social challenges have exposed the limitations of traditional development models, making sustainable development imperative. ESG (Environmental, Social, and Governance) investing, which integrates corporate sustainability performance into financial analysis, has gained global prominence.

In China, ESG investing has rapidly evolved. Since SynTao Green Finance introduced the first domestic ESG rating in 2015, ESG-themed funds grew 36% year-on-year to ¥800 billion AUM by 2021. Regulatory support intensified in 2022 when China's securities watchdog mandated ESG disclosures for listed companies.

However, research remains fragmented. Most studies examine ESG factors in isolation or focus on Western markets, leaving China's ESG-stock performance nexus underexplored. This paper addresses this gap by analyzing how ESG ratings affect Chinese listed firms' stock returns (2015–2021) using an augmented Fama-French model. We hypothesize significant return disparities between rated/unrated firms and high/low ESG performers, suggesting market differentiation.

2. Literature review and research hypotheses

2.1. Literature review

The impact of ESG on corporate performance remains inconclusive in international research, while domestic studies remain limited due to China's early-stage ESG development. However, prevailing evidence suggests a positive relationship. Friede et al. (2015) conducted a meta-analysis, finding that most studies reject a negative ESG-performance correlation. Velte (2017) observed that ESG performance, particularly governance, enhances German firms' return on assets (ROA). Conversely, Atan et al. (2018) demonstrated that while individual ESG factors show limited effects, composite ESG scores significantly reduce Malaysian firms' cost of capital.

Research on ESG's market impact focuses on two dimensions: (1) ESG-performance linkages and (2) ESG-based investment strategies. Kumar et al. (2016) found that ESG-disclosing firms exhibit lower risk and higher returns. Nagy et al. (2017) compared four MSCI ESG-based strategies, revealing that momentum strategies outperform improvement strategies, while tilt strategies surpass positive screening.

Existing studies offer diverse methodologies and regional insights, yet few examine how ESG ratings influence Chinese stock returns. This paper bridges this gap by analyzing ESG's differential effects on rated vs. unrated and high- vs. low-rated firms in China's market.

2.2. Research hypotheses

2.2.1. The market-differentiating role of ESG ratings

In China, ESG disclosure remains largely voluntary for most listed companies, with mandatory reporting required only for specific firms. Currently, China lacks standardized ESG disclosure frameworks, resulting in low participation rates, incomplete data, and inconsistent reporting practices. However, ESG rating agencies compile comprehensive assessments by analyzing corporate annual reports, official announcements, regulatory filings, media coverage, and public evaluations—With annual reports serving as the primary data source. Firms without ESG ratings typically lack sufficient disclosure. According to information asymmetry theory, ESG ratings convey material information that may influence investor decisions and market outcomes. This leads to our first two hypotheses:

H1: Companies with ESG ratings exhibit significantly different stock returns from those without ratings, indicating market recognition of ESG disclosure status.

H2: High-ESG-rated firms demonstrate significantly different stock returns from low-rated firms, suggesting market differentiation based on ESG performance levels.

2.2.2. ESG ratings and stock returns

Stakeholder theory suggests that ESG performance asymmetrically affects the interests of various parties, creating a dual mechanism of value enhancement and value erosion. Among them, the positive impacts include: strong ESG performance brings reputational dividends, attracting more investment; the opening of China's capital market encourages global ESG funds to increase allocations to highly rated companies; policy dividends such as carbon neutrality and social governance reforms amplify the advantages of ESG leaders. Negative impacts include: ESG investment may increase operational costs, squeezing short-term profits; companies with poor ESG performance face higher risk premiums due to sustainability risks.

If H1 and H2 hold, there are two competing inferences: The first aligns with a positive effect—Companies with ESG ratings outperform unrated companies, and higher-rated firms achieve superior returns (implying a positive correlation). The second aligns with a negative effect—ESG investments underperform due to cost burdens or risk pricing (implying a negative correlation).

To resolve this tension, we propose:

H3: ESG-rated firms generate higher stock returns than non-rated firms.

H4: High-ESG-rated firms deliver lower returns than low-rated firms.

3. Model construction

3.1. FF5+YMN model

$$R_{it} - R_{ft} = \alpha_i + \beta_1 MKT_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 RMW_t + \beta_5 CMA_t + \beta_6 YMN_t + \varepsilon_{it} \quad (3.1)$$

Where R_{it} is individual stock return, R_{ft} is risk-free rate, MKT is market risk premium factor, SMB is size factor, HML is book-to-market factor, RMW is profitability factor, CMA is investment factor, YMN is ESG rating presence factor, and ε_{it} is random error term. The regression coefficient of YMN is the key focus of this study: if the YMN coefficient is significant, then H1 is supported, indicating the market can distinguish between companies with and without ESG ratings.

3.2. FF5+GMB model

$$R_{it} - R_{ft} = \alpha_i + \beta_1 MKT_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 RMW_t + \beta_5 CMA_t + \beta_6 GMB_t + \varepsilon_{it} \quad (3.2)$$

Where GMB represents the ESG rating quality factor (high-low ESG rating differentiation). The regression coefficient of GMB constitutes the primary focus of this research: should the GMB coefficient prove statistically significant, it would provide support for hypothesis H2, demonstrating that financial markets are capable of distinguishing between firms with high versus low ESG ratings.

4. Empirical research

4.1. Data selection

This study utilizes A-share listed companies on the Main Board and Growth Enterprise Market (GEM) from 2015 to 2021 as the overall research sample. Specifically, ESG ratings are measured by Bloomberg ESG Disclosure Scores; stock returns refer to monthly individual stock returns with cash dividend reinvestment considered; the risk-free rate adopts the 1-year RMB term deposit rate published by the People's Bank of China; market returns represent the monthly average returns of A-share Main Board and GEM stocks weighted by circulating market capitalization; financial data originates from consolidated annual reports of listed companies. All data sources include the official Bloomberg website and CSMAR database.

4.2. Empirical results and analysis

4.2.1. Empirical results of FF5+YMN model

Table 4.1. Fixed-effects panel regression results of FF5+YMN model.

Variable	Coefficient
MKT	1.027***(-108.279)
SMB	0.490***(-20.952)
HML	0.022(-1.005)
RMW	-0.143***(-4.577)
CMA	-0.119***(-4.157)
YMN	0.139***(-3.247)
_cons	0.145***(-5.118)
N	87972
adj. R ²	0.271

Notes: t-statistics in parentheses; *, **, *** denote significance at 10%, 5%, and 1% levels respectively (similarly hereinafter).

We test H1 and H3 using the FF5+YMN model. **Table 4.1** presents the panel regression results based on a sample of stocks from rated companies during 2015-2021, examining the impact of ESG ratings on individual stock returns. As shown in the regression results, the YMN coefficient is significantly positive, indicating that the stock returns of rated companies differ significantly from those of unrated companies, with the market clearly distinguishing between them. Furthermore, it suggests that the presence or absence of ESG ratings has a positive effect on stock returns, with rated companies exhibiting higher stock returns than unrated ones, and investing in rated companies yields higher stock returns. Overall, the regression results of the FF5+YMN model support accepting H1 and H3.

4.2.2. Empirical results of FF5+GMB model

Table 4.2. Fixed-effects panel regression results of FF5+GMB model.

Variable	Coefficient
MKT	1.019***(-104.349)
SMB	0.530***(-24.645)
HML	0.153***(-9.404)
RMW	-0.067***(-3.054)
CMA	-0.059***(-3.278)
GMB	-0.214***(-8.751)
_cons	0.276***(-21.527)
N	87972
adj. R ²	0.275

We examine H2 and H4 using the FF5+GMB model. **Table 4.2** presents the panel regression results based on a sample of rated company stocks, investigating the impact of ESG ratings on individual stock returns. As shown in the regression results, the GMB coefficient is significantly negative, indicating that the stock returns of high-rated companies differ significantly from those of low-rated companies, with the market clearly distinguishing between them. It also suggests that higher ESG ratings negatively affect stock returns, with low-rated companies exhibiting higher stock returns than high-rated ones. Investing in low-rated companies can yield higher stock returns. Overall, the regression results of the FF5+GMB model support the acceptance of H2 and H4.

5. Conclusions and recommendations

The main findings of this study are as follows: First, there exist significant differences in stock returns between companies with ESG ratings and those without, as well as between high ESG-rated companies and low-rated ones, indicating that the market can effectively distinguish firms based on both the presence and level of ESG ratings. Second, when using the presence of ESG ratings as an evaluation criterion, the positive effect of ESG-rated companies representing better corporate quality dominates, resulting in higher stock returns for ESG-rated companies compared to unrated ones; when using ESG rating levels as the evaluation criterion, the negative effect of low ESG-rated companies representing higher ESG risks dominates, requiring higher risk compensation for investing in low-rated firms, which consequently leads to higher stock returns for low ESG-rated companies compared to high-rated ones.

Based on these conclusions, investors should actively incorporate ESG factors into their decision-making processes by considering ESG elements across all investment stages, including investment philosophy, research, execution, and performance evaluation. Furthermore, government authorities should accelerate efforts to establish unified standards and principles for ESG information disclosure by listed companies, develop corresponding regulatory frameworks, guide companies to strengthen their ESG practices, and promote the healthy and orderly development of ESG investment in China.

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